

Hanford Beryllium

Program Development and Lessons Learned

Presented by
Elton R. Hewitt, CIH, CSP
Fluor Daniel Hanford
Richland, WA

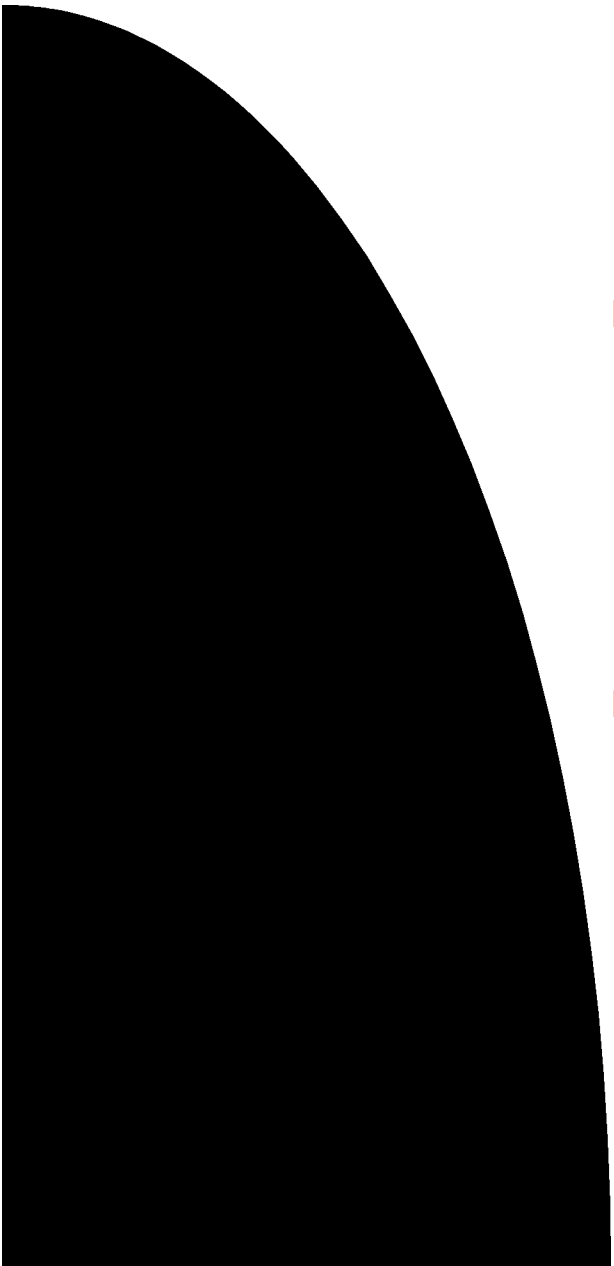
Hanford Beryllium History

- Beryllium use at Hanford began in early 1950's
- Used primarily in 5% beryllium alloy in braze rings for fuel rods
- Also used in ceramics and metals
- Virtually all beryllium usage was discontinued by 1986

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Previous Studies

- DOE initiated a study by Stone and Webster in 1988
- They concluded that nearly all past beryllium exposures had been below OSHA PEL ($2 \mu\text{g}/\text{m}^3$)
- No known cases of beryllium sensitization or berylliosis
- No current exposure to beryllium



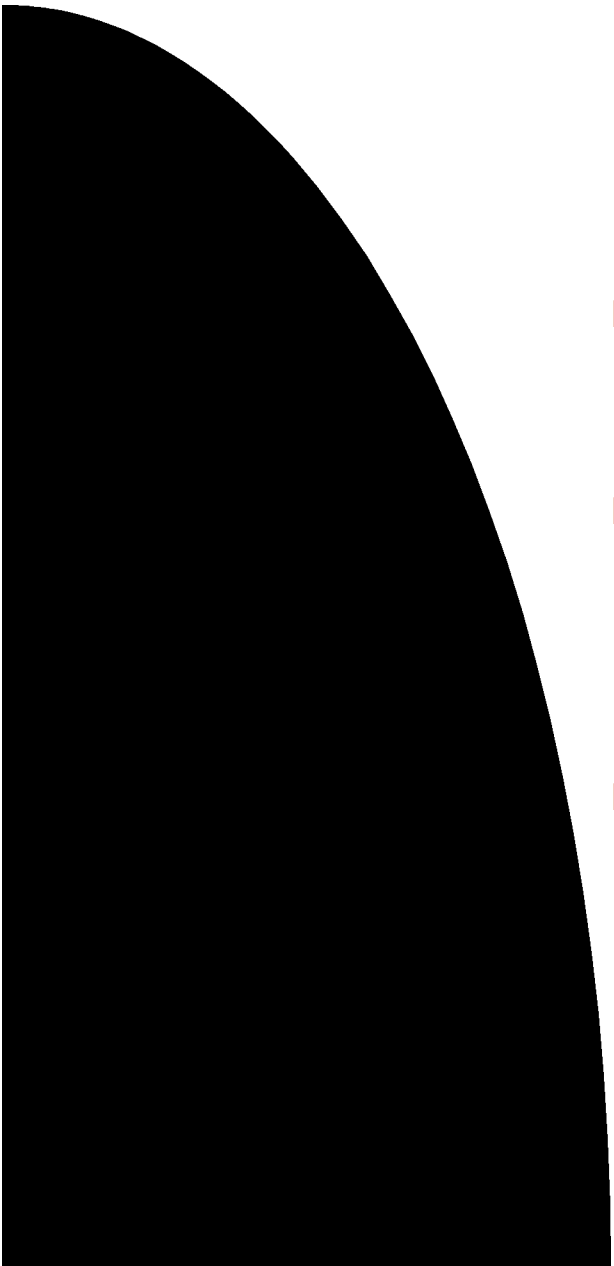
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Recent Events

- Issuance of DOE N 440.1
 - ◆ Raised concern level, but Hanford was not covered by N 440.1
 - ◆ Began looking into beryllium
- December 1997 Events
 - ◆ Health Conference at Richland
 - ◆ Preliminary study on beryllium
 - ◆ Distorted newspaper article
 - ◆ Raised DOE, employee concerns

Hanford Beryllium Program Development

- Decided to rapidly implement beryllium program in Dec. 1997
- Initial program focus
 - ◆ Employee education
 - ◆ Historical beryllium facility list
 - ◆ Procedure to estimate past employee exposures to beryllium
 - ◆ Medical surveillance program
 - ◆ Multi-contractor task force



Hanford Beryllium Employee Education

- Needed to quickly disseminate accurate beryllium information
- Also needed to gather information from employees regarding where they had worked
- Decided to use several different vehicles to accomplish both of these objectives

Hanford Beryllium Education Tools

- Immediately set up “beryllium hotline” to field employee questions
- Issued letters to all employees on beryllium and planned actions
- Developed employee questionnaire to obtain employee information on beryllium exposure
- Put together list of common beryllium questions and answers

Hanford Beryllium Education Methods

- Held series of meetings across site to discuss beryllium questions
- Put articles in site newspaper to provide accurate information
- Set up beryllium web site with all employee letter, Q&A, employee questionnaire, beryllium facility list
- Had H&S professional contact each person who called hotline

Hanford Beryllium Lesson Learned #1

- Communicate, communicate, communicate!
- Even if information is incomplete
- Even if information is uncertain
- Use as many mechanisms as possible
- Respond individually to individuals with problems or concerns

Hanford Beryllium Beryllium Facility List

- Initially very little information on where beryllium was used
- Worked with DOE-RL to develop initial facility list
- Used as many sources as possible
 - ◆ Employee interviews
 - ◆ Past sampling data
 - ◆ Previous beryllium report
 - ◆ Historical documents

Hanford Beryllium List Development

- Took several months to assemble information on facilities
- Had to work with several contractors
- Gathered information on where, when and how beryllium was used
- Prepared a 1-2 page “fact sheet” for each facility where beryllium was thought to have been used

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Fact Sheet Information

- Date, Facility, Contractor, Preparer
- Past Operations
 - ◆ Where was beryllium used, form
 - ◆ Period of beryllium usage in facility
 - ◆ Summary of area monitoring data
 - ◆ Summary of personal monitoring data
 - ◆ Engineering controls utilized
 - ◆ Maximum estimated exposure

Hanford Beryllium Fact Sheet Info (cont)

- Current Operations
 - ◆ Is facility still present?
 - ◆ If beryllium still present in facility?
 - ◆ Current operations in facility
 - ◆ Maximum estimated exposure
- Basis for above information
- Comments on past or current operations and beryllium levels

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Fact Sheet Summary

- Generated beryllium facility fact sheets for total of 54 facilities
- Took about 2 1/2 months to finish
- Though incomplete and subject to change, it provides a single place to look for beryllium questions
- Used to estimate past employee beryllium exposure levels
- Will be used to plan work

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Lesson Learned #2

- Assemble all available beryllium information into one document
- Make it available to all employees (I.e., put it on the internet, address <http://www.hanford.gov/safety/beryllium/index.htm>)
- Effort spent in preparing such a list will pay off later when questions arise about beryllium usage

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Exposure Estimation

- Many concerned employees with potential beryllium exposure
- Needed procedure to estimate actual exposure
- Beryllium fact sheets helped, but only estimated maximum exposure
- Needed additional information to accurately estimate individual beryllium exposure levels

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Need for Information

- Problems in obtaining historical employee information
 - ◆ Many contractors over past 50 years
 - ◆ Information difficult to obtain on which jobs employee worked on
 - ◆ Limited information available due to security, both then and now
 - ◆ Decided that information from employees would be most useful

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Questionnaire Info

- Name, ID, Date, Hire Date
- For each facility on suspect list
 - ◆ Dates, locations worked in facility
 - ◆ Nature of beryllium activities
 - ◆ Activities performed by employee
 - ◆ Respiratory protection worn
 - ◆ Control measures used
- Checklist of symptoms for chronic beryllium disease

Hanford Beryllium Assessment Process

- IH reviews each questionnaire
 - ◆ Compares info to that obtained on beryllium facility fact sheets
 - ◆ Initial assessment is the maximum estimated potential exposure
 - ◆ Reduced based on questionnaire
 - ✦ Type, length of work performed
 - ✦ Distance from beryllium operations
 - ✦ Engineering controls used

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Exposure Categories

- Exposure risk determined
 - ◆ High - $>2.0 \mu\text{g}/\text{m}^3$ (OSHA PEL)
 - ◆ Significant - $0.2 \Rightarrow 2.0 \mu\text{g}/\text{m}^3$ (OEL)
 - ◆ Low - $0.01 \Rightarrow 0.2 \mu\text{g}/\text{m}^3$ (~LOD)
 - ◆ None - $<0.01 \mu\text{g}/\text{m}^3$
- Exposure risk used for placement in medical surveillance program for previously exposed workers
- Employees notified by letter

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Lesson Learned #3

- Determine procedure for assessing former worker exposure
- Document procedure used
- Involve employees in exposure assessment procedure
- Communicate results to employees with letter providing information and listing options